Messaging and Location Tracking Service Devices

Part 15
Subpart E

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15.401 SCOPE

This subpart sets out the regulations for unlicensed Message and Location Tracking Service (MLTS) devices operating in the 3-30 MHz frequency band.

15.403 DEFINITIONS

(a) Coordinatable MLTS device. MLTS devices whose transmit center frequency is sufficiently controlled to allow adequate coordination relative to incumbent (primary) users of this band.

(b) Cooperative Network. The geographical region over which a single MLTS provider provides network coordination services to MLTS user devices.

(c) Emission bandwidth. For purposes of this subpart, the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 6 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

(d) Message and Location Tracking Service (MLTS) Clear Channel Assessment (CCA) device. A necessary component of the MLTS fixed infrastructure used to provide real-time assessment of clear channel activity for use in coordinating MLTS user devices.

(e) Message and Location Tracking Service (MLTS) user devices [Unlicensed]. Intentional radiators operating in the frequency bands 3-30 MHz that provide a wide array of wide area mobile and fixed messaging, location, and tracking communication services to businesses and individuals and whose frequency of transmission is coordinated by MLTS CCA devices.

(f) PEAK transmit power. The peak power output as measured over an interval of time equal to the frame rate or transmission burst of the MLTS user device under all conditions of modulation. Usually this parameter is measured as conducted emission by direct connection of a calibrated test instrument to the equipment under test. If a device cannot be connected directly, alternative techniques acceptable to the Commission may be used.

(f) Spectrum window. An amount of spectrum equal to the intended emission bandwidth in which operation is desired.

(g) Thermal noise power. The noise power in watts defined by the formula N=kTB where N is the noise power in watts, k is Boltzmann's constant, T is the absolute temperature in degrees Kelvin (e.g., 295°K) and B is the emission bandwidth of the device in hertz.

15.405 EQUIPMENT AUTHORIZATION REQUIREMENT

MLTS devices operating under this subpart shall be certified by the Commission under the procedures in Subpart J of Part 2 of this chapter before marketing. The application for certification must contain sufficient information to demonstrate compliance with the requirements of this subpart.

15.407 COORDINATION WITH LICENSED SERVICE TRANSMITTERS

An MLTS user device shall be coordinated by CCA devices arrayed geographically in a fixed infrastructure. The technical requirements associated with the CCA coordination function are defined in Sections 15.409 and 15.411.

15.409 GENERAL TECHNICAL REQUIREMENTS

(a) The 3-30 MHz band is limited to use by MLTS devices under the requirements of this Section as well as Sections 15.411 - 15.415.

(b) All transmissions must use only digital modulation techniques.

(c) Peak transmit power shall not exceed 200 milliwatts multiplied by the square root of the emission bandwidth in hertz. Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

(d) The MLTS user device shall automatically discontinue transmission in the case of either absence of information to transmit or operational failure. These provisions are not intended to preclude transmission of control and signaling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

(e) Notwithstanding other technical requirements specified in this subpart, attenuation of emissions below the general emission limits in section 15.209 is not required.

(f) The device must comply with IEEE C95.1-1991, (ANSI/IEEE C95.1-1992), "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz." Measurement methods are specified in IEEE C95.3-1991, "Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave." Copies of these standards are available from the IEEE Standards Board, 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331. Telephone 1-800-678-4333. All equipment shall be considered to operate in an "uncontrolled" environment. The application for certification must contain a statement confirming compliance with IEEE C95.1-1991. Technical information showing the basis for this statement must be submitted to the Commission upon request. The ANSI/IEEE standard uses the term "radiated power" as meaning the input power to the antenna.

15.411 Specific requirements for MLTS Clear Channel Assessment (CCA) and user devices operating in the band 3-30 MHz

(a) Operation of all MLTS user devices shall be contained within the band 3-30 MHz.

(b) MLTS Clear Channel Assessment (CCA) devices monitor the spectrum for which an MLTS user device transmission is intended to occupy, and must meet the following criteria:

(1) All MLTS user devices acting within a cooperative network must be coordinated by three or more geographically dispersed MLTS CCA devices, each separated from another by at least 1000 km.

(2) Multiple spectrum windows may be monitored either in parallel or in series by each MLTS CCA device in a cooperative network for purposes of coordinating multiple MLTS user devices.

(3) The monitoring system bandwidth for a clear channel decision must be equal to or greater than the emission bandwidth of the intended transmission.

(4) The monitoring threshold for each CCA device must not be more than 10 dB above the estimated total noise power (thermal plus other noise sources such as galactic and environmental) for a bandwidth equivalent to the emission bandwidth of the coordinatable MLTS user device.

(5) Each MLTS CCA device in a cooperative network must monitor the spectrum window/s it intends to effect for at least 10 seconds on a continuous or sampled basis. If spectrum monitoring is

performed on a sampled basis, a minimum of four samples must be taken over the 10 second period.

(6) If no signal above threshold (as set forth in subsection 4 above) is detected during the monitoring interval (as set forth in subsection 5 above) at each and every CCA device in the cooperative network, a transmission may immediately commence in the monitored spectrum window by a coordinatable MLTS user device.

(7) The duration between the initial declaration of a clear channel by CCA devices in a cooperative network and the conclusion of a coordinatable MLTS user device transmission on the subject clear frequency shall be no longer than 10 seconds.

(8) After completion of a transmission, an MLTS user device must cease transmission and wait until the spectrum window has again been monitored. That is, channel access monitoring must be performed prior to all MLTS user device transmissions.

(c) The emission bandwidth of an MLTS user device shall not exceed 3 kHz.

(d) Emissions shall be attenuated below the reference modulated peak power as follows: 30 dB at a bandwidth greater than or equal to twice the emission bandwidth; 50 dB at a bandwidth greater than or equal to four times the emission bandwidth.

(e) The frequency stability of the carrier frequency of intentional radiators operating in accordance with this section shall be equal to or better than +/-10 ppm over 5 seconds or the interval between channel access monitoring, whichever is shorter. The frequency stability shall be maintained over a temperature variation of -30° to +50° Celsius at normal supply voltage, and over a variation in the primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20 degrees Celsius. For equipment that is capable of operating only from a battery, the frequency stability tests shall be performed using a new battery without any further requirement to vary voltage.

(f) The duration of any single MLTS transmission shall be no longer than five seconds.

15.413 ANTENNA REQUIREMENT

An unlicensed MLTS device must meet the requirements of Section 15.203.